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Listerellosis of Cattle in Azerbaijan.

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In recent years, in some of the rayons of Azerbaijan, S S R, a disease formerly unknown to the local veterinary workers has been noted in the cattle. This disease was characterized by symptoms which chiefly affected the central nervous system (paresis, paralysis).

On the basis of clinical observations and autopsies the local veterinarians considered that a poisoning by a poison of vegetational origin was the cause of the sickness. Prophylactic measures against the poisoning, however, gave no positive results.

Having set the explanation of the given disease's etiology as our goal, we carried out bacteriological investigations on a large quantity of pathological material taken from carcasses of animals that had died, or had been killed through necessity. As a result, a culture of the listerellosis pathogen was isolated in the majority of cases. At the same time, blood parasites, rabies, poisonings by heavy-metal salts, arsenic, and alkaloids were eliminated from consideration.

The listerellosis pathogen was isolated from all the internal organs and the brain. For a check as to the pathogenicity of the isolated pathogen, white mice were infected by an intraperitoneal injection of a culture or a suspension from the pathological material. The mice fell within 2-11 sutki (24 hour periods - Tr note), depending upon the dose and the culture strain.

In parallel with the bacteriological investigation, we investigated the clinic, the pathological anatomy and the epizootology of the animal sickness.

According to the data of the veterinarians, the sickness was first registered in the cattle in 1952, when the drive to summer pastures was cancelled.

In 1952 the sickness was registered in 3 establishments, and in 1956 - in 14. Cows with calf and milk cows were primarily affected, but in individual establishments even the younger cows of the 6-12 month age group were infected.

The first cases of the sickness are registered in July; in September and October the disease attains its maximum development, and in November only solitary cases are noted.

According to our observational data, the sickness in the western rayons has assumed a stationary character and is registered every year in the very same establishments, which are situated in the foot-hill zone, and among the

cattle which are located on forest-brush pastures, and also in a few establishments situated in the low-lying zone.

Cases of abortion were noted in three establishments (13 cows). Upon a bacteriological investigation of three aborted fetuses, a culture of the listerellosis pathogen was isolated in each case. In one of the establishments a single incidence of the disease was registered for a buffalo cow.

It should be noted that in the course of one season this disease may produce two outbreaks with a 20-25 day interval in the very same establishment. This period coincides with the time that animals are subject to attack by (Ixodes) ticks.

Regardless of literary data concerning susceptibility to listerellosis, in the rayons being investigated, sheep and goats were not affected. This, evidently, is explained by the fact that the sheep livestock here are driven to high, mountain, summer pasture at the beginning of the activation period of the ticks. It is also necessary to note that in September, as a rule, the sheep are subjected to a twice-repeated antiscabetic dip that also excludes the possibility of their infestation by ticks.

This circumstance gave us the basis to surmise that the vectors of the disease, under our conditions, could be ticks.

For confirmation of our assumptions bacteriological investigations were carried out on ticks collected from cattle located on the farms affected by listerellosis. As a result of these investigations a pure culture of the listerellosis causative agent, pathogenic for white mice, was isolated from the ticks.

The role of the ticks as vectors of the infection was also confirmed by the fact that on the farms where tick control measures had been carried out, the sicknesses were not observed. It is also necessary to note that in the years when meteorological conditions were unfavorable for the tick's propagation (rainy weather), the sickness is observed less frequently.

The clinical indications depend, in many respects, on the form of development of the disease; with the acute course, the animal becomes ill suddenly and at first separates from the herd; the condition is depressed; refuses feed; a wobbly gait; often lays down, rises with difficulty and later on does not rise at all; weak vision; pulse rate, 104-120; breathing, 36-62 per minute. Often, spasms in the separate muscle groups of the body are noted; the general body temperature is normal in the majority of the cases, but rises at times to as high as 41°. The animal dies within 24-48 hours.

With an affliction of the central nervous system, a disturbance of the coordination of movement is noted on the 3rd or 4th day: the animal limps, the legs are widespread; sometimes the animal travels sideways; while moving, it strikes against surrounding objects, indicating that the vision is weakened; the animal begins to walk in circles. Keratitis and conjunctivitis are noted, often the conjunctivae of the eyes acquire a grayish-blue color,

and the observable mucous membranes are pale. In a few cases in the animals, on the 1st or 2nd day, a disturbance of the gastrointestinal tract is noted: in some, atonia of the paunch; in others, frequent defecation, or a diffuse diarrhea which is accompanied by severe straining. After an abortion or calving the disease at times manifests itself as an obstetrical paresis, after an abortion a suppurative discharge from the uterus is observed.

Sometimes the disease occurs in a foribund form, the animal gapes, bellows, evidences fear; slobbering is observed;the indicated symptoms lead to a paralysis of the extremities and within 7-10 days the animal dies.

In isolated cases the disease takes a chronic course and is protracted as long as 30-40 days. In addition to that, regardless of the comparative improvement of the general condition and the manifestation of an appetite, the animal cannot rise. Together with these, there is also a mild form of the disease noted, where the clinical indications are expressed weakly and the animal recovers within 7-10 days.

In the majority of the cases, upon autopsy of the dead animals, we detected pathological changes in the internal organs and the brain. The typical rigidity is well expressed and the hair loses its luster. The subcutaneous tissue and musculature are pale. Sometimes, in the chronic course, an infiltrate is formed in the subcutaneous tissue of the gill. The mucous pharynges, larynges and tracheae are hyperemic and covered with a foamy-sanguinolent fluid. The lungs are pale, gray and red patches are noted. In some cases hemorrhages are detected in the pericardium and more frequently in the endocardium, the heart muscles are flaccid, and in the persistent form, compact.

The liver is blood-filled, of a compact consistency and threade with hemorrhages and minor necrotic spots of a yellowish-gray color. The gallbladder is filled, sometimes hemorrhages are observed in its mucous membrane; the spleen is irregularly thickened and compressed, a hemorrhage is sometimes noted. The kidney capsule is easily removed; the kidney is covered by plural hemorrhages, in some cases gray spots are encountered. The paunches are filled with food masses, the mucous membrane of the true stomach is thickened, beneath it are spot and streak hemorrhages, there are necrotized sections in different spots, and often erosion of varied form and size. The mucous membrane of the narrow section of the intestine is inflamed, beneath the mucosa are punctate hemorrhages, and in the wide section of the intestine are found streak hemorrhages. The lymphatic glands are inflamed and hemorrhagic; in cross section, the upper layers have a dark red color and the central part a grayish-red color. The blood becomes a liquid. Suppurative peritonitis and pleurisy were detected in two cases.

The central nervous system is subjected to the main pathologic-anatomy changes. In the encephalon the blood vessels are strongly congested, hemorrhages are in the pia mater (in the forward portion of the large hemisphere of the brain and in the area of the cerebellum in the majority of the cases), and in rare cases hemorrhages were observed in the dura mater. There are cases of an accumulation of liquid of a turbid, grayish-red color.

In the aborted fetuses and in the fetuses from cows which died from listerellosis, changes are expressed by an edema of the fetus and by hemorrhages in almost all of the internal organs.

In the acute form of the disease, the changes in the internal organs are more expressed than those in the persistent form, and, conversely, the alterations in the central nervous system stand out more distinctly in the chronic form.

For the treatment of the animals with listerellosis, streptomycin, penicillin, biomycin and synthomycin were used. Of the 118 sick animals not subjected to treatment, 94 died (93.6 %). of the 60 which underwent treatment, 13 died (21.6 %).

Streptomycin was used intramuscularly in a dose of 500,000 units in 3 ml of physiological solution for the mature cattle, with a repeat every 6 hours for a period of 36-84 hours, i. e. from 3 to 7 million units, depending upon the condition of the animal. The young were given the antibiotics in half-doses. The indicated preparations have more effect in the early stage of the disease than in a later stage.

At the points where listerellosis occurs repeatedly, and also at the establishments where outbreaks are observed, it is necessary to carry out the following measures: a mechanical cleansing of the installation and of the places where the animals are kept, with a subsequent thorough disinfection; isolation of sick animals and those animals that have recovered from the disease; a systematic processing of the animals to protect them from ticks; a change of pastures and watering places, or a transfer of the animals to pens; an improvement of care and maintenance, and also a provision of succulent foods, concentrates and mineral substances.

Conclusions

1. It was ascertained by us that the cattle disease in Azerbaijan was listerellosis.

2. Listerellosis in cattle is observed in the low-land and foothill zones.

3. Listerellosis of cattle appears in the summer and fall months and maintains a stationary character.

4. The mature livestock (milk cows or cows that have been bred) are more susceptible to the listerella infection, the young contract the disease less frequently; buffaloes also suffer from the disease.

5. Abortions are observed when listerellosis occurs in cows that are with calf.

6. We succeeded in isolating Listeria from (Ixodes) ticks taken from the cattle at the farms affected by listerellosis.

7. At the farms where the cattle were subjected to anti-tick measures, listerella infections were not observed.

8. The best therapeutic effect in the cattle was obtained through the use of streptomycin in the first stage of the disease.